



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,685	04/16/2004	Suning Wang	2002-033-03US	8860

48503 7590 02/11/2008

PARTEQ RESEARCH & DEVELOPMENT INNOVATIONS
QUEEN'S UNIVERSITY
KINGSTON, ON K7L 3N6
CANADA

EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

02/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/825,685

Applicant(s)

WANG ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,5-15, 17-22 and 32-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 21 is/are allowed.
- 6) ☒ Claim(s) 2,5-15, 17, 18, 20, 22 and 32-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1. This Office action is in response to applicant's amendment received November 08, 2007, which amends claims 5, 8, 9, 40, 51 and 52. (Although identified in the amendment as "currently amended", the status identifier for claim 10 should be "previously presented".)

Claims 2, 5-15, 17-22 and 32-52 are pending.

2. The rejection of claims 40-47, 49 and 50 under 35 U.S.C. 112, 1st paragraph, as set forth in the Office action mailed August 08, 2007, is overcome by claim amendment.

All prior art rejections set forth in the Office action mailed August 08, 2007 are overcome by claim amendment.

3. The indicated allowability of claims 6, 7, 10, 17, 18, 20 and 22 is withdrawn in order to raise the issue of obviousness-type double patenting over claims of US 7,291,404 B2 to Aziz et al. The obviousness-type double patenting rejection is set forth later in this action. The present application and the '404 patent to Aziz et al. have the same effective U.S. filing date, do not have any inventors in common, and do not appear to be commonly owned. However, in view of the article by Rui-Yao Wang et al. in *Advanced Functional Materials*, Vol. 15, pp. 1483-1487 (2005), which is made of record with this action, it appears that the claims are directed to an invention that may have been made as a result of activities undertaken within the scope of a joint research agreement. (See MPEP 706.02(I)(2)III regarding evidence required to establish a joint research agreement.) If the claimed invention was not made as a result of activities undertaken within the scope of a joint research agreement (and presuming the conflicting patent is not

commonly owned with this application), then the obviousness-type double patenting rejection is moot but further consideration may be required under 35 U.S.C. 135.

4. Previously withdrawn process claims 8, 9, 51 and 52 are hereby rejoined, and previously withdrawn product claims 15, 32-39 and 48 are hereby rejoined, since the only issue remaining with respect to independent claims 5, 10 and 40 is the obviousness-type double patenting rejection based on the '404 patent to Aziz et al.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 15, 32-39 and 48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 15 is drawn to a luminescent probe comprising a compound as claimed in claim 2 or claim 10, and claim 48 is drawn to a luminescent probe comprising a compound as claimed in claim 41.

Claims 32-36 are drawn to various products (photocopier, photovoltaic device, photoreceptor, solar cell, semiconductor) comprising a compound as claimed in claim 5 or 40 wherein photons strike the compound and charge separation occurs in the compound.

Claims 37-38 are drawn to a molecular switch and claim 40 is drawn to a circuit comprising the molecular switch of claim 37 or 38 wherein the molecular switch comprises a compound as claimed in claim 2 (further limited to two specific compounds in the case of claim 38) wherein acid, base, and/or incident light produces a change in the luminescent state of the compound.

These claims do not limit the structure/composition of the claimed products beyond the requirement for the compound.

The application as originally filed describes compounds within the scope of the compound claims, and describes in detail electroluminescent devices made with compounds within the scope of the compound claims.

While the application as originally filed also teaches that the disclosed compounds may be used for various purposes/products other than an electroluminescent device, including those recited in present claims 15, 32-39 and 48, the specification does not describe the claimed products in such a way as to enable one skilled in the art to make and/or use the claimed products. The compound alone is insufficient to make the claimed products. The specification provides insufficient detail as to the structure/composition of the products (i.e. with respect to components of the products other than the compound), and provides insufficient detail as to how/where the compound is incorporated into each of the claimed products, to enable one of

ordinary skill in the art to make and/or use the claimed products. It is not clear that the full scope of claimed products can be made merely by taking known device structures for luminescent probes, photocopiers, photovoltaic devices, photoreceptors, solar cells, semiconductors, molecular switches, and circuits comprising a molecular switch and using a compound within the scope of the specified compound claim(s) in place of another luminescent compound in the known device structures (in the case of claims 15, 37-39 and 48) or in place of another charge separating compound in the known device structures (in the case of claims 32-36).

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 8, 9, 51 and 52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The method steps recited in claims 8 and 9 are not fully consistent with the compound as claimed in claim 5. The examiner interprets lines 3 and 4 of claims 8 and 9 as two separate steps. Claims 8 and 9 require that the method of synthesizing the compound as claimed in claim 5 comprise at least one step selected from these two steps. However, if only the first step is carried out, one does not have compounds as claimed in claim 5. PhenImZ, which results from the first step set forth in claims 8 and 9, is a compound of formula (1) wherein Y is hydrogen.

The definition of Z as set forth in method claims 8 and 9 is not fully consistent with the definition of Z as set forth in compound claim 5, and the definition of Z as set forth in method claims 51 and 52 is not fully consistent with the definition of Z as set forth in compound claim 40. Claims 5 and 40 define Z as a substituted or unsubstituted aryl moiety selected from a Markush group of specific aryl moieties. In contrast, the “substituted or unsubstituted” language does not appear in the definition of Z in claims 8, 9, 51 and 52, and the Markush group of specific aryl moieties recited in the definition of Z in claims 9 and 52 is narrower than the Markush group for Z in claims 5 and 40, respectively.

Given the discrepancies between the definition of Z in the compound claims and the definition of Z in the method claims, it is not clear if method claims 8 and 9 are intended to provide the full scope of compounds claimed in claim 5 as implied by the preamble of claims 8 and 9, or only a subset of the claimed compounds. Likewise, it is not clear if method claims 51 and 52 are intended to provide the full scope of compounds claimed in claim 40 as implied by the preamble of claims 51 and 52, or only a subset of the claimed compounds.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 2, 5-14, 17, 18, 20, 22, 40-47, 49-52 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-59, 61 and 62 of U.S. Patent No. 7,291,404 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Present claims 2, 5-7, 10, 20, 22 and 40-43 are drawn to a compound. Patent claim 59 is drawn to an electron transport material comprising a compound of a specified formula. The only positive limitation of the material of patent claim 59 is the compound of the specified formula, and there is overlap between the compound required for patent claim 59 and the compound as defined in present independent claims 5 and 40 wherein Z is a substituted or unsubstituted anthryl group and Y is an aryl group or aliphatic group. Patent claim 59 refers to the compound as an azole compound. While no patent claim is limited to a compound within the scope of the present compound claims, one of ordinary skill in the art would be lead by the patent claims to compounds within the scope of the present claims given claims such as patent claims 19 and 20. Patent claims 19 and 20 are directed to an electroluminescent device comprising an azole compound. Patent claim 19 requires the azole compound to be selected from a group consisting

of seven specific azole compounds, four of which are compounds within the scope of the azole compound required by patent claim 59. These four compounds are also compounds within the scope of the compound defined in present claims 5 and 40, and further defined in present claims 2, 6-7 and 41-43. Patent claim 20 further limits the azole compound to a specific azole compound that is within the scope of the compound of present claims 2, 5-7, 10, 20 and 40-43. Further, a person who is in possession of the compound of present claim 20 will be in possession of an electron transporting material of patent claim 59.

With respect to the specific compound of present claim 22, which is also one of the four compounds of present claim 10, while the patent does not claim the compound per se, one would be lead to the presently claimed compound by the patent claims (e.g. patent claim 19 recites the compound of present claim 22).

One of ordinary skill in the art also would be lead to other compounds within the scope of the present compound claims wherein Y is an aryl group or an aliphatic group, and Z is a substituted or unsubstituted aryl moiety such as phenyl, naphthyl, anthryl, pyridyl or quinolinyl, and to electroluminescent devices comprising such compounds by the azole compound required by the device claims of the patent. For example, see patent claims 3, 4 and 19.

While the electroluminescent device claims of the patent require the azole compound as a component of an electron injection/transporting zone or mixed charge transport layer of a luminescent region whereas present claims 17, 18, 49 and 50 specify that the compound is used as an emitter that electroluminesces when an electric field is applied across the emitter, the presently claimed compounds and the azole compounds of the patent claims are inherently

capable of electroluminescing and are inherently capable of transporting electrons. The present and patent device claims do not restrict the compound, or the layer comprising the compound, from providing multiple functions of electroluminescence and charge transportation. With respect to additional functional layers required by the patent device claims that are not required by the present device claims or vice versa, the patent device claims and present device claims do not exclude additional layers between the electrodes. It would have been within the level of ordinary skill in the art to construct an electroluminescent device using multilayered structures known in the art at the time of the invention.

Present method claims 8, 9, 51 and 52 are included in this rejection because azole compounds as required by the patent claims can be made by the claimed methods. For example, one carrying out the first and second steps of present claims 8 and 9 (or the second step alone) using PhenImZ wherein Z is anthryl would be in possession of an electron transport material as defined in patent claim 59.

With respect to present claims 11, 12, 44 and 45, the patent does not claim a composition comprising the azole compound, an organic polymer and a solvent, but solution coating methods of making electroluminescent devices were known in the art at the time of the invention. The use of polymers as binders was known, as was the use of polymers to provide other functions such as hole transportation. It would be an obvious modification to combine an azole compound of the patent claims with a solvent and a polymer to provide a layer of an electroluminescent device by solution coating methods.

With respect to present claims 13, 14, 46 and 47, the electroluminescent device of the patent claims is an eletroluminescent product, and the fabrication of flat panel display devices using electroluminescent devices was known in the art at the time of the invention.

11. Claims 19 and 21 stand allowed.

12. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

/Marie R. Yamnitzky/
Primary Examiner, Art Unit 1794

MRY
February 04, 2008